

Proton Driver RF Meeting Aug 31, 2004

(G.W. Foster)

***** NO meeting this week(Sept 7th) ; TESLA collaboration meeting ******

Attendees: Bob Kustom, Ralph Pasquinelli, Fernanda Garcia, Pierre Bauer, Dave Wildman, Chris Jensen, Victor Yarba, Jim Strait, Milrad Popovic, Vladiimir Kashikhin, Shreyas Bhat, Bill Foster

MINUTES

1. MESON AREA SMTF AREA EQUIPMENT LAYOUT.

Kerry Ewald's drawings of the layout of the 325 MHz front-end linac in the M-P beamline area in Meson was discussed. The overall Meson area SMTF layout is being developed by a group led by Peter Limon meeting Thursday afternoons.

- a) The M-E beamline is allocated to a 1300 MHz cryomodule test, which will eventually grow into a full RF station (3-4 cryomodules) fed by the A0 photoinjector.
- b) The M-P beamline area is allocated mainly to the 325 MHz front-end linac, with some overflow from the control racks eventually needed for the A0 photoinjector.
- c) A CW SCRF test facility is also under discussion, plans less developed.

The concept is sketched in:

http://tdserver1.fnal.gov/8gevinacpapers/Meeting_Minutes/RF/Meson_SMTF_Layout_Concept.ppt

Individual drawings of the meson area and 325 MHz linac are at:

http://tdserver1.fnal.gov/8gevinacpapers/Meeting_Minutes/RF/Meson_Area_prelim_Layout.pdf

http://tdserver1.fnal.gov/8gevinacpapers/Meeting_Minutes/RF/325_Linac_Area_Prelim_Layout.pdf

2. Beta<1 325 MHz FRONT END LINAC LAYOUT & PLANS

GWF described plans for the 325MHz beta<1 test area. A single Klystron will be used to drive the entire front-end linac, using an RF power split and the fast-ferrite phase shifters. There appears to be a lot of interest world-wide in this type of linac and it is hoped to develop a design & prototype collaboration for various components of the linac.

Gennady Romanov will be coordinating meetings dedicated to the 325MHz front end.

The ultimate configuration is a 28m, 35 MeV beam line containing:

- a) an Ion source copied from the SNS (or possibly Triumf)
- b) a 3 MeV Radio-Frequency Quad (RFQ) copied from JPARC(JHF) front end
- c) a 3 m Medium-Energy-Beam Transport (MEBT) section copied from the SNS
- d) a first 10m tank; either a Cryomodule, or warm DTL tank copied from JHF, or...
- e) a second tank which will be a Cryomodule with spoke resonators
- f) a 1m long beam analysis box
- g) a front end control/rack area ~2x the size of the SNS front end room
- h) a modulator footprint taken from D. Wolff's presentation at May 25th meeting.

A shielding cave 16' wide by 25m long surrounds the linac starting at the first DTL tank. Bob Kustom expressed some question as to whether this shielding wall would be needed.

A single 3 MW 325 MHz JHF Klystron drives the entire front end linac. The floor area reserved for the RF power split is approximately 15m x 4.5m. Bob Kustom is working on equipment layout for a power splits based on either the Radial Combiner or Waveguide/Directional Coupler type RF fan-out.

The RF power required by the Ferrite tuners on each leg of the 325 MHz fanout is 20kW per SRF cavity. This power level can be handled, with care, using plated-circuit striplines, and it is hoped that each leg of the RF fanout can be controlled by a "circuit board" containing the circulator, branch-line hybrid, ferrite tuners and bias coils.

The minutes of the RF meetings are online at:

http://tdserver1.fnal.gov/8gevinacPapers/Meeting_Minutes/RF/Index.html